

# Overview of How DEP Evaluates/Regulates Chemicals in the Environment

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# Standard-Setting Process

- Each law mandates a specific approach
- Typically includes some analysis of the potential risk of harm posed
- Can also include other factors...
  - Cost-Benefit Analysis
  - Risk-Balancing
  - Best Available Control Technology (BACT)
  - Negotiated Endpoints



# Risk Assessment Basics

- Risk levels can be described in different ways:
  - No Risk, No Significant Risk, Acceptable Risk, Unacceptable Risk, Allowable Risk, Significant Risk, one-in-one million,  $10^{-6}$ , *etc...*
- Risk levels can be calculated or estimated.  
When DEP calculates risk, we are intentionally “conservative” – we intentionally overestimate the risk to be health protective.
- Risk estimates should always be prefaced by  
*“The estimated risk may be as high as X,  
but is likely to be much lower.”*  
(Usually it is just implied.)



# Risk Assessment Basics

$$\text{Risk} \approx \text{Exposure} \times \text{Toxicity}$$

The more contact (exposure) you have with a chemical, the greater the potential risk.

The more harmful (toxic) the chemical, the greater the potential risk.



# Exposure Basics

- “Exposure Assumptions” describe the contact with contamination, such as the amount of...
  - Water you drink
  - Air you breathe
  - Soil you eat
- Exposure assumptions include receptor details, such as body weight and age.
- Exposure assumptions also include the concentration in soil, water, air, *etc.*



# Toxicity Basics

- Look at both cancer and non-cancer effects
- Information comes from laboratory studies in animals and from human epidemiological studies.
- “Sensitive Sub-populations” are also considered
- Chemical-specific toxicity values are published
  - Cancer slope factor (or unit risk) for carcinogens
  - Reference Concentrations for non-cancer effects



# In Summary...

An allowable level (in soil, water, air...) is typically determined considering the potential risk posed by exposure to the substance, using health-protective assumptions about the exposure and toxicity.

The level may also be adjusted based on other considerations, such as background levels, feasibility issues, technological factors, risk-balancing, etc...

